

AMENDMENTS TO THE CLAIMS

1. (*Currently amended*) An isolated DNA molecule, ~~comprising a nucleotide sequence encoding a proteorhodopsin protein with at least 78% amino acid identity to Sequence ID No:7, wherein said proteorhodopsin protein has a secondary structure of seven transmembrane α -helices and a retinal binding pocket~~ the amino acid sequence shown in Sequence ID NO:5 or Sequence ID NO:7.

- 2-3. (*Cancelled*)

4. (*Currently amended*) The isolated DNA molecule of claim 1, wherein said ~~nucleotide sequence~~ DNA molecule comprises the nucleotide sequence shown in Sequence ID NO:4 or Sequence ID No:6.

5. (*Currently amended*) An expression vector comprising ~~t~~The isolated DNA molecule of claim ~~137, wherein said proteorhodopsin-specific primers include three nucleotides encoding a non-native amino acid, creating a new restriction endonuclease site not present in the native sequence of said isolated DNA molecule, thereby allowing subcloning of said isolated DNA molecule in an expression vector.~~

6. (*Currently amended*) The ~~isolated DNA molecule~~ host of claim 41, wherein said bacterium is *E. Coli*.

- 7-38. (*Cancelled*)

39. (*Currently amended*) A host comprising the expression vector ~~The isolated DNA molecule of claim 5, wherein said expression vector containing said isolated DNA molecule expresses said proteorhodopsin protein~~ is expressed in said host.
40. (*Currently amended*) ~~The isolated DNA molecule of claim 39, wherein said host is a~~ An artificial membrane system comprising the proteorhodopsin protein of claim 1.
41. (*Currently amended*) ~~The isolated DNA molecule~~ host of claim 39, wherein said host is a bacterium.
42. (*Currently amended*) ~~The isolated DNA molecule of claim 41, wherein said host is a~~ A cell membrane preparation of said the bacterium of claim 41.
43. (*Currently amended*) ~~The isolated DNA molecule~~ host of claim 39, wherein said host is a eukaryote.
44. (*Currently amended*) ~~The isolated DNA molecule of claim 43, wherein said host is a~~ A cell membrane preparation of said the eukaryote of claim 43.

Claims 45-129 (*Cancelled*).